Quality Assurance Tools for the Engaged Program Manager

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Economic downturn, changing technology, smaller defense budgets, initiatives promulgated years ago by Vice President Gore for more commercial off the shelf (COTS) items—all have played an impact on sustaining existing military systems. Some acquisition managers have tried to include all of these environmental influences into an obsolescence program, as these all have the same effect on limiting the ability to replenish your supply system. As an active program manager, you'll hear of some of these supply problems in your regular meetings. And you'll be required to provide direction to a solution.

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For critical safety items (CSIs), your engineering team will have to provide an approved source and assure, at a minimum, that a government source inspection is part of the acceptance process. But this is no guarantee the delivered parts will be usable. Indeed, the Product Data Reporting and Evaluation Program (PDREP) maintained by Naval Sea Logistics Center is replete with procurements gone awry. Despite the best intentions of acquisition teams, you'll find large quantities of products that do not meet the requirements of the customer. Products that are manufactured, marked, or configured incorrectly—they'll all be there in the Product Quality Deficiency Reports. Read these, and you'll also discover that the products were often delivered late, in addition to being of poor quality.

As the program manager, you'll be presented with the situation where the need for a product remains; the demand is still present. You'll find that other procurement vehicles were tried and did not result in successful deliveries. You may also find that there are open contracts for the product, and your team doesn't have high confidence that the vendors will deliver. You can review the current situation and ascertain approximate pricing, including historical costs and possible expedited pricing data. As these unique products are not readily available—otherwise, you'd have already chosen that route—you can expect that the lead time for delivery will be long. After all, some supplier will have to obtain the material, fabricate and process, shape, paint, inspect, mark, etc., before presenting to the government for inspection and acceptance.

While there are some immediate actions that can be taken to meet the current demand, such as cross-decking parts from other platforms or cannibalizing parts from out of service equipment, the program manager should strive to find a reliable supply source. Whether the source is organic or commercial, there are tools that can be used to initiate a contract, give the contract the best odds of delivering quality products, and guarantee the acceptability of the product before turning it over for use. Each of these tools has a complexity, cost, and schedule factor, so it is important to understand the benefit of each.

Specific Tools to Increase Probability of Product Success

An important and integral part of any procurement is the quality assurance provisioning. Specify inadequate quality assurance, and you may end up with products that cannot be used by the military customer. Overspecify the quality assurance provisions, and you waste money and may alienate the vendor and the Defense Contract Management Agency (DCMA) personnel, who are usually assigned quality oversight. Careful consideration should be expended to evaluate all the tools available at the time of contract planning to arrive at the level that is appropriate.

Not all tools are appropriate for every application. This isn't the right time to check all the blocks under the quality assurance heading for your solicitation plan. There is great risk in assuming that some tools are in place because "it's a government contract." Although the government might eventually be made whole by a vendor that delivered unacceptable product, years will pass before you as the program manager will ever hear the news. There is also risk in assuming that a vendor's reputation based on past performance is sufficient to satisfy quality assurance needs. Procurement history will show this is often the premise for a poor decision. Vendor name recognition or large size does not always correspond to high quality for every product.

Following are the tools available to the program manager, along with a description of each and the author's rating of the tool and its cost benefit.

Site Survey

A site survey can be a very beneficial tool in determining if the facilities are in place for producing a product. In today's world, where you could receive a bid from a virtual company, an actual hands-on visit can and should be used. To make this trip of value and avoid the impression of a government-paid vacation for acquisition support personnel, determine and select your visiting team appropriately. Consider bringing, from quality assurance, a knowledgeable person to review the contractor's inspection system. If you are buying precision components that require three-decimal-place tolerances, a quality person who has experience measuring these types of products will be beneficial. Likewise, if you have a requirement for non-destructive inspection, take a person certified in these areas to review the vendor processes and inspection equipment. Because many vendors use third-party subcontractors, plan to address this in your site survey.

If you are buying quantities of items, plan on evaluating the ability of the production facilities to produce products at the rates needed in the contract. Large lots often require more au-

tomation. Have someone who can interpret computer numerical control based production and inspection. Don't forget to get assurance from the contractor that the facilities where the product will be manufactured are the facilities you want to review. All vendors today subcontract some portion of their award to others. Concentrate your survey on the most important aspects or the areas of highest risk to produce the product. You can find these focus areas in prior product deficiency reports. An outstanding information source for planning your trip is the DCMA. They may be able to provide past site surveys, industrial reports, and firsthand insights, and can complement your team with subject-matter experts.

To benefit from a site survey, you need to spend time researching and planning. The first step of a survey is not the call to the travel agency. Don't spend more money on the survey than the product will cost. For the most part, site surveys can be avoided.

Post-Award Conferences

The post-award conference is by far the most valuable, high-return-on-investment tool for ensuring a successful delivery. It occurs after contract award but before the contractor starts work. As most vendors are anxious to get started, the window for this event is narrow. The post-award conference, which can be conducted by telephone, should include personnel who understand the drawing and specifications (technical); the contracting officer who issued the contract (and can explain the wording in the contract); the on-site government representative who will be monitoring the progress of the vendor; the program manager; and the vendor's team.

This is the opportunity for all to review the contract clause by clause, delivery schedule, specifications, drawing interpretations, and special provisions. This is not just for the vendor's benefit, as it gives the program manager and technical team a hands-on review of what actually ended up in the contract (which may often surprise the government technical and quality team!). You can exchange names and contact information which can alleviate bottle necks later. A post-award conference may take less than 2 hours and will save volumes of energy later.

Pre-Award Conferences

These conferences are meetings where the government and potential contractors can get together and clarify statements of work and other information. It is a superb way to manage expectations for both parties. They serve especially well to explain tasking that is not clear in the solicitation. These work best when the work or contract structure is new or unique. It is especially welcome for new vendors. It gives the government and the vendor one last time to clarify language before bidding on the contract. For the most part, these can also be conducted by telephone.

Customer Feedback

In the Defense Department, feedback can be collected from reading deficiency reports readily available in the PDREP database. These are searchable by cage number, contract number, part number, and other means. They sometimes reveal company quality trends that can alert you to areas of concern. This database is frequently used to determine sourcing of products.

There are some caveats. Many companies have multiple cage codes, so it is important to investigate the correct location where the work will be performed. Newer companies may have no deficiency reports, which may lead you to a false sense of quality about a company. Other companies may have many deficiency reports but that may be reflective of being in business for a long time and a large business base.

To take advantage of this quality information, you need to read and interpret each report for applicability. There are many reasons why the quantity alone should not be used as an indication of the quality of a vendor's product. Many times, the deficiency report cites a system level part number rather than the specific part number where the actual deficiency is located.

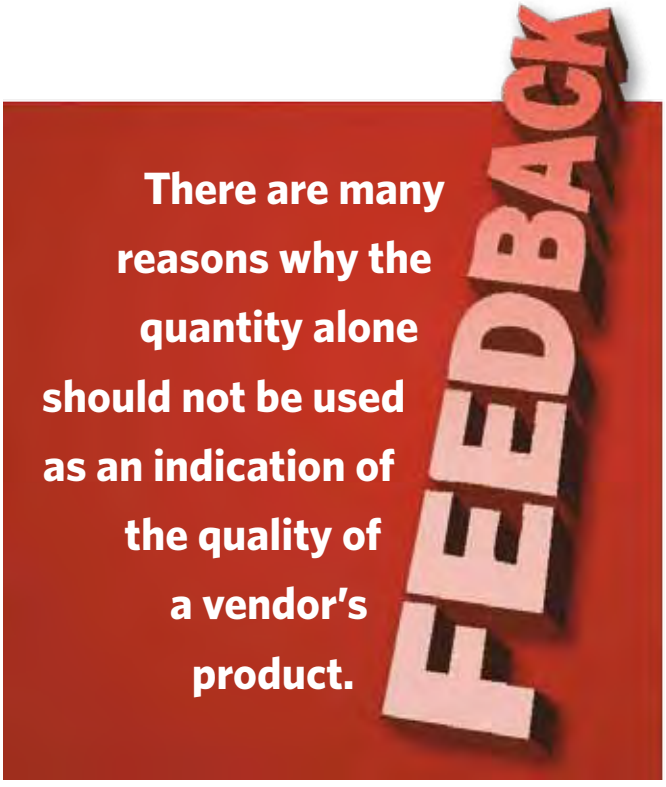
Someone also may process a deficiency report and the final disposition will indicate that the vendor cited on the initial report was not at fault. Another significant observation with deficiency reports is that it is labor intensive to collect the data and enter it into the database. For this reason, many in the community who use the parts and find the defects do not process deficiency reports. The bottom line for using this information is to read each report for applicability to your product.

Quality Assurance Level of Instruction (QALI)

Often pronounced by its acronym, "kwol-eye" isn't the fighting friend of Princess Kitana in Mortal Kombat. This QALI is a unique government to government letter that is sent to the DCMA quality assurance representative (QAR) for the vendor that received the award. In conjunction with both Federal Acquisition Regulation 52.246-2 and FAR 52.246-11 clauses in the contract, the QALI should be prepared by the technical authority and sent via the contracting officer. When written properly, the QALI will emphasize the importance of the contract and make sure that the QAR will monitor the progress of the vendor. It should guide the QAR in ensuring that appropriate specifications, features, inspections, and testing are verified by the DCMA team.

When quantities are specified, the QALI should stipulate the sampling rate to be followed for the classification of characteristics on the drawing. Usually, these rates will be different for critical, major, or unclassified characteristics. The QALI can state that the QAR has to personally witness specific processes, such as welding inspections or passivation of metal.

The QALI serves to heighten the alertness level of the QAR that a particular contract requires special attention. It should be written with consideration that the QAR has other work to do in addition to this contract oversight. It should be easy to follow, making it easy for the QAR to plan government source inspections throughout the manufacture, marking, packing,



and delivery. As most vendors use subcontractors, the QAR will have the responsibility to delegate those parts of the QALI to the QAR at the subcontractor locations. Clear and precise language in the original QALI will help ensure a successful inspection and oversight plan.

From a cost standpoint, the QALI is inexpensive. It should always be used for critical items or items that have complex processes. It should be used when you have had an unacceptable failure rate, so that other vendors can make the product correctly. It should be used when delivery and schedule delays will impact the ability of the military to execute their mission. It should be written before the contract award, so that the letter can be sent within 5 days of contract award in order to have benefit. Lastly, the QALI should be acknowledged by the QAR so that exceptions can be addressed.

Third-Party Verification Inspections

For most of the military parts and systems, an adequate inspection program can be established with the vendor and DCMA oversight. Inspections and product verifications are conducted at vendor facilities using vendor inspection tools. This is the preferred and most cost- and schedule-efficient method.

There are times, however, when third-party inspections are warranted. These would include scenarios where the consequence of a failure could cause an extreme catastrophic event and the probability of the event is high. There are limited examples of these programs, given the high cost to maintain them.

One example of this type of a program is the Navy's Level 1/ SUBSAFE program. Following the loss of *USS Thresher* in 1963, for which the failure of a salt-water piping joint was cited, the Navy implemented a stepped-up quality program to ensure that critical systems were manufactured under rigid control. After the loss of the *USS Scorpion* in 1968, the inspection requirements were reinforced under the Navy's SUBSAFE program. The SUBSAFE program continues to require independent verification and certification of critical parts.

Third-party systems are expensive, add schedule, and require knowledgeable and skilled employees to execute. Program managers have to safeguard strict definitions to assure that parts don't get added to the "must inspect" lists unnecessarily. It is not unusual for the cost of the inspection to exceed the cost to produce the product. Program managers should consider use of this option for limited application, only until a more efficient process and supply channel can be established.

A third-party inspection program should be managed by a cost-conscious manager. When these programs are unmanaged, the default position is often to inspect every part and feature. This is not necessary, as some features can be sampled, and some features will not affect performance or safety. A great deal of savings can be gained by better management.

First Article Test

First article testing (FAT) can ensure that the contractor can furnish a product that conforms to all contract requirements for acceptance. It allows you to verify capability before committing to a single vendor for a large quantity. On most occasions, FAT will increase schedule and cost. To manufacture one item is usually very inefficient, so the cost to include FAT has to be considered. On the other hand, if you waive FAT, then the contracting office is committing more to a vendor that may not be successful.

There are some options worth considering before signing up for FAT. It is terribly inefficient for a vendor to use equipment that would be used to manufacture quantities to produce only the FAT item. Acquisition regulation allows the contracting officer to approve subsequent lots before FAT approval and to provide payment for certain material needed beyond that needed for FAT. If your industrial experts understand how the vendor will make a specific item, it is better to structure your contract accordingly.

To illustrate: The current requirement is to manufacture 300 critical fasteners used in the hub assembly of a propulsion system. The product is well designed and has been produced before by other suppliers. And while tolerances are tight, it is the consensus of the industrial team that the vendor has the capability to manufacture. The most likely manufacturing plan for the vendor will be to secure the material for all 300 items. A manufacturing plan will be developed whereby fasteners can be made in batches consistent with machine capability and manpower. Product will be produced in lots—i.e., five or 10 at a time would be nominal.

For this example, FAT would not be recommended. Products covered by previously developed complete and detailed tech-

nical specifications should consider alternatives to FAT. A very practical alternative is the use of a complete inspection of the first lot. This type of testing, a modification of production lot testing (PLT), allows the vendor a more realistic way to manufacture product in an efficient way. By inspecting the first lot in great detail, you can make slight adjustments in future lots if necessary. You can also gain confidence in the entire process.

Certifications by Third Party

A Certificate of Quality Compliance (COQC) can be a valuable clause in contracts to alert the contractor that certifications are required for the material described. It is especially of value for the technical team in ensuring the product is in compliance with the specifications. These certificates provide reasonable, objective evidence that the part has the integrity needed. Unless otherwise stated, the certificates should be listed as documents to be delivered with the products listed in the contract. If this clause is invoked, it is absolutely important to have someone read and interpret the documents by comparing the certification with the specifications in the contract. Unfortunately, it is not uncommon for the certification furnished with the product not to match the product drawing.

Some common certificates are those that specify the origin of the material used to manufacture the parts; certifications of personnel to perform specific tasks, such as welding and non-destructive inspections; and certifications regarding testing and inspections—e.g., heat treatment or passivisation of metal or radiographic, magnetic particle, dye-penetrant, and ultrasonic testing.

These certifications are an inexpensive means to ensure the product is made correctly. As long as the requirements for the certifications are included in the contract, the vendor should flow this requirement to his or her subcontracting team.

Conclusion

These common quality tools, used in the proper mix, can go a long way toward ensuring product integrity. There are other methodologies that can help outputs meet contract requirements, including process reviews, system and company audits, quality-system evaluations, management and program reviews, and progress reports. In today's environment, where some of America's best suppliers are also exporting precision products to companies overseas, DoD is competing for limited manufacturing capacity at private facilities. Sometimes these companies argue that the government's oversight greatly exceeds other customers' needs for similar precision products. It therefore becomes the burden of the program manager and his or her team to balance quality assurance, vendor base, and performance risk. When a vendor refuses to cooperate with all the requirements in a solicitation, the program manager has to find a solution.

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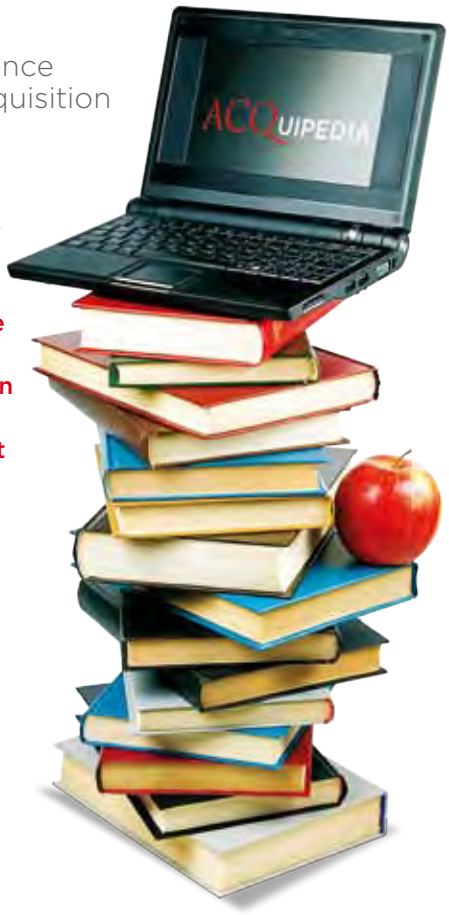

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